COMMENTARY

Continuing Education - Is it Valid?

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INTRODUCTION

Continuing Education has been described as the "longest and arguably most important phase of medical education"(1). This could equally be applied to all disciplines within health care. This component of a practitioner's career is viewed by some as an integral part of their professional development, constantly attempting to improve and refine their skills and knowledge, with the aim of improving their level of patient care. Others may view this phase as unnecessary and intrusive on their valuable time.

This paper is an attempt to provide an objective view after conducting a search of the recent medical and chiropractic literature to determine what evidence, if any, exists to determine the effects of continuing education, be it compulsory or not, on the quality of practice provided by chiropractors and osteopaths.

A search of MEDLINE and CHIROLARS databases using the keywords of; *education, continuing* and *compulsory/mandatory* was conducted.

A full list of the references obtained is included(2-63). Many of the articles are commentaries or reviews rather than substantive research.

Legislative changes from governments will in all likelihood determine the continuing education requirements for all fields of healthcare, and it would seem that in the age of quality assurance this occurrence is inevitable sooner rather than later.

OVERVIEW OF CONTINUING EDUCATION

The assessment of the importance of continuing education has been reviewed in the biomedical literature over three decades with Davis et al(1) compiling probably the largest computerised bibliography containing over 1500 citations relating to the study and review of continuing education, particularly medical continuing education. The current climate requiring accountability of practitioners and the education they receive has spored a large industry of continuing education. Resulting from this there has been the growing need to determine what constitutes quality continuing education.

According to Ward(64) "Continuing medical education is the longest, yet least understood, part of the medical education continuum...It is an area in which apathy and debate, innovation and tradition, fact and opinion can all be found. However, increasing consumer awareness, political imperatives and, of course, professional ethics demand guarantees of effective continuing education, continuing clinical competence and assurances of the quality of medical care". The same can of course be said of chiropractic and osteopathy.

Many definitions have been given to the process of continuing education, but can be summed up as; further learning and the processes facilitating this end, that are undertaken following completion of undergraduate or graduate education.

The purpose of such further education is ultimately to maintain and improve patient care, and improve the health of the population. Ward(64) notes that the relationship between further learning and improved standards of health care are complex and multi-factorial issues involving practitioners, patients, administrators and governments, who all would by their very nature, classify "quality health care" using quite different parameters. This in turn would account for many perceived differences and short-comings within continuing education.

A noted absence of peer-reviewed literature regarding continuing education exists within the chiropractic and osteopathic professions as evidenced by a paucity of articles located on the data-base searches. None of the articles address the issue of continuing education research, and merely provide a commentary or opinion on the topic. Hence much of what can be learned about the benefits or otherwise of continuing education with respect to chiropractic and osteopathic practice must be extrapolated from the existing medical, paramedical and allied health literature. The differences in the modes of practise must be considered when assessing the issues concerned with continuing education.

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EVALUATION OF CONTINUING EDUCATION

When evaluating continuing education two criteria are used within the literature to determine the effects of continuing education. These are;

- Practitioner Performance (Competency)
- Health Care Outcomes

Practitioner Performance (Competency)

The determination of practitioner performance (competency) forms the basis of a significant part of continuing education programmes that are conducted. The ability of a practitioner to perform a test or procedure, and to interpret tests (eg x-rays) lends itself to various assessment methods. There is however, little evidence as to whether the ability to successfully complete these tasks will improve the practitioner's ability to improve the patient's health, which is the obvious ultimate goal of continuing education.

Some studies have investigated both practitioner performance and its effect on health care outcomes, whereas many assess the performance of the practitioner alone. In their review of the literature Davis et al(1) note the following methods used to affect the general clinical management of physicians; use of opinion leaders or "educational influentials" to modify behaviour, well designed instructional methods or computer generated reminders to lead to change in behaviour.

The frequency of use, or cost arising from the use of investigations such as laboratory tests or imaging studies, readily permits a comparison between practitioners who have undergone continuing education and those that have not. The judicious and appropriate employment of these investigations is reflected in the utilisation pattern following continuing education programmes. This analysis is often included in a combination of intervention measures.

Within medical practice the prescribing practices of physicians is also a frequently used measure to determine the effects of continuing education. The use of computerised feed-back, chart review and the use of physician-educators was found to be beneficial in altering the prescribing practices of physicians.

Appropriate counselling skills supplemented with didactic sessions, workshops and printed material aimed at modifying physician behaviour are utilised to assist physicians counsel patients. This has been particularly useful in smoking cessation programs.

Continuing education programs directed at preventative care employing computer-generated reminders to stimulate physicians to perform certain tasks have also proved reasonably effective in improving physician behaviour.

Other methods that have not been subjected to randomised controlled trials include clinical reasoning processes, procedural or technical skills, the referral process and information management skills(1).

Methods relevant to chiropractic and osteopathy from the abovementioned topics may include; use of opinion leaders to influence practitioner behaviour, computer-generated reminders to invoke the practitioner to perform a specific task or test, appropriate didactic and workshop sessions to influence general clinical management including laboratory and imaging testing. Further to this general counselling skills particularly in preventative care practices relating to musculoskeletal conditions (such as back pain), could be addressed, as could technical skills that may need refinement. These could be effective measures that may be included in continuing education programs for chiropractors and osteopaths.

Computerised feed-back from the Health Insurance Commission (HIC) to medical practitioners in Australia, gives the practitioner feed-back as to how their prescribing, test ordering patterns, and patient consultation servicing patterns compare to the rest of the profession. Similar analyses could be applied to chiropractic and osteopathic management of third party payor patients where suitable databases exist. Imaging, and to a lesser extent laboratory testing patterns could be reviewed in a similar fashion. Appropriate education programmes could be utilised to address areas demonstrating short-comings.

Health Care Outcomes

Studies addressing health care or patient outcomes have not proved as conclusive with their results, as have the practitioner performance investigations(1). The measures that have been studied include; smoking cessation, hypertension, functional status, asthma, and arthritis which generally lend themselves to objective assessment and appropriate clinical trials.

Similar measures have been employed in these studies, utilising opinion leaders, didactic and workshop sessions, printed material, reminders and patient education strategies in an effort to change the practitioner's behaviour, which in turn attempted to alter the patient's clinical outcome.

It must also be remembered that much of the research done regarding continuing medical education is conducted within a hospital setting or a Health Maintenance Organisation (HMO). These facilities differs from private medical practice, and for that matter chiropractic or osteopathic practice. Significant levels of supervision and the employment of strict protocols exist in these environments, in conjunction with meticulous record-keeping and regular accountability checks. This enables more objective an accessible data collection. Interpretation of results from these settings must be viewed accordingly.

In summary, according to Davis et al(1) of the 50 randomised controlled trials studied that met their inclusion criteria only eight of the eighteen studies that examined patient outcomes showed any benefit from continuing medical education. The majority of the forty-three studies that examined physician's performance showed some significant change, but this was not quantified. Programmes that were concerned purely with the dissemination of information had little if any effect on patient outcomes and did not influence the physician's behaviour to any significant degree.

It soon becomes evident that problems of outcome assessment of patients encountered within chiropractic and osteopathy practice, (which is common to all disciplines involved in the field of musculoskeletal medicine), must play a significant role in determining the effects of continuing education. In essence, how do we determine if a patient is better? Do we measure their ranges of motion? Ask them how they feel (Visual Analogue Scale)? Ask them how they are able perform their activities of daily living (Oswestry Disability Index)? Or do we measure their capacity to perform physical work (Functional Capacity Evaluation)? This issue is imperative not only in the area of continuing education, but with determining standards of care in practice, and the related issues of funding, and scientific and community acceptance.

Clearly, research should accompany continuing education in chiropractic and osteopathy.

MEETING THE NEED

For continuing education programmes to be ultimately effective they must meet the needs of the "learners", ie the practitioners undertaking the programmes. Further to this the programmes must address the requirements of the profession(s) and the direction the profession(s) will take in the foreseeable future.

These programmes must also reflect the changing needs and expectations of the community the profession serves. Ward(65) states that in medicine academic institutions are best able to assess the trends from a clinical, epidemiological, and sociological standpoint which should provide the frame-work to determine the continuing educational needs of the profession(s).

Sourcing the patient ie. end user of a service, via the use of interview and questionnaires is an effective way of determining if the needs of the differing individual patients are met with current practices. It also provides an opportunity to further educate the community in areas affecting their health. Assessment of individual practices via questionnaires also allows determination of the needs of the individual practitioner by identifying deficiencies in their practices. These types of audits are conducted within general medical practice, but has not been employed with the chiropractic and osteopathic professions at this stage.

This form of "quality assurance" is regarded by many as an invasion of their civil liberties and smacks of "big brother" intervening in their mode of practice. However this intervention has become common-place in various other industries, and will become a more pressing issue in future years.

The continuing education bodies are able then to base their programmes on the requirements of the practitioner and community. Adequate funding needs to be provided to address these issues prior to the development of any compulsory education programmes, and preferably prior to the establishment of a large infrastructure and "industry" that churns out unnecessary and irrelevant material that will divert from the needs of the patients and community.

The difficulty is to stimulate the practitioner to identify their needs and deficiencies. Once they have made the commitment to redress these short-comings in their knowledge and skills, then the process of continuing education becomes a self-driven environment with professional ethics and self-directed motivation the key to producing more proficient practitioners. As the process develops the individual needs of certain practitioners can be accommodated, with the likes of workshops, didactic programmes and written material presented in a format that utilises the self-directed approach to continuing education. More structured programmes can be utilised to educate practitioners to newer developments or relevant current research findings. These sessions that will be

beneficial to the entire profession can be offered on a larger scale.

THE QUESTION OF COMPULSORY CONTINUING EDUCATION

Following trends arising from the United States of America the issue of enforcing continuing education as a pre-requisite for re-registration has arisen throughout the various professions involved in health-care, with the aim of maintaining and improving the standard of practitioner knowledge and skill levels to evoke a subsequent improvement in the quality of care provided to patients.

In a recent review of medical continuing education Hayes(67) noted the situation in the state of Illinios in the United States of America, where continuing education became mandatory in 1978, and the law later repealed in 1984. Studies of this situation found that doctors noted no difference in their participation in continuing medical education before, during or after these periods. The institutions who provided the continuing education during this time claimed that the attendances actually did increase during the mandatory period, and later decreased after the law was repealed. Further to this 82 per cent of the doctors and 81 per cent of the suppliers of continuing education were of the opinion that repeal of the law had no effect on the quality of care that was provided to patients.

The major issue that stimulates debate amongst those involved in the compulsory continuing education debate is who determines the quality and quantity of the material presented, and who determines the obligation to continue further education following completion of the undergraduate or graduate studies. The concept of a bureaucracy driven continuing education system infers a "big brother" mentality making professional determinations for the profession(s). To some "the necessity to impose continuing education externally is an admission by the profession that it has failed to inculcate in its members a commitment to lifelong learning as an inherent feature of medical practice."(66).

It is vital to identify the needs of practitioners via needs assessment interventions as discussed above, and determine what criteria are important for the development of quality continuing education programmes if they are to be successful. Hayes(67) advocates the use of peer review, practice and practitioner audits to identify the continuing educational needs of practitioners. The use of an educationally trained tutor is suggested to facilitate the establishment a programme that will maximise the benefit for the practitioner. The programme may involve an array of activities from formal programmes, reading or visits to colleagues to meet the educational needs of each individual practitioner.

Often compulsory continuing education is associated with very formal and structured programmes that may be of little value in day to day practice. The necessity to attend to meet designated attendance rates can tend to diminish the process and disenfranchise practitioners who perceive all continuing education programmes as merely a means to an end ie obtaining enough points to qualify for re-registration. The attitudes to the pursuit of further knowledge and skill needs to be developed early in the undergraduate years of education. The stimulus for striving for further knowledge and acquiring a level of professional ethics and motivation that will last the length of one's career should be engendered at the formative stages, rather than attempting to "make a leopard change its spots". This is the challenge that must be met at this time.

The main arguments for and against the implementation of mandatory continuing education are outlined in Tables 1 and 2.

Table 1

A. The Argument for Mandatory Continuing Education *

- The current low participation in continuing medical educational programmes needs to be improved
- The public image of physicians needs to be improved and the public appears to accept the effectiveness of mandatory continuing education
- Funding of continuing education will be secured more easily if participation is mandatory - just like undergraduate education and specialty training
- Continuing medical education is necessary to maintain self-regulation for the professions and to deter government intervention in the quality of patient care
- It improves the performance of "sluggish" practitioners
- There could be a possible reduction of the cost of care
- There has been an increase in concern about malpractice. As a result of mandatory continuing education, competence should be raised and there would be fewer malpractice events

- Registration Acts and association/college membership regulations can be tied more readily to mandatory continuing education
- It provides an appropriate transition phase into other more effective systems of professional accountability and it establishes the concept that some requirement for relicensing is essential
- Maintains and continues an informed professional awareness
- Minimises professional and geographic isolation
- Ensures that even very busy practitioners take time away from their practices to attend educational programmes

***** Taken from Ward(66) (adapted from Chouinard)

Table 2

B. The Argument Against Mandatory Continuing Education *

- The acquisition of information through continuing education is only the first step in the application of changes to clinical practice
- Compulsory attendance does not generate self-direction, motivation to learn or a sense of professional accountability. It is naive to believe that the unmotivated, disinclined physician will benefit from a system of enforced continuing education
- The potential exists for practitioners to rebel against compulsion and legislation, particularly if the effectiveness of the compulsory system has not been demonstrated. This would mitigate against learning
- The essence of professionalism - individual initiatives, motivation and personal responsibility to maintain clinical competence - is either ignored or denigrated
- The policing of compulsory continuing education is costly
- As a legal, mandatory continuing education could be an infringement of civil and professional rights
- The accreditation of continuing educational programmes (that is, a mechanism for quality assurance in education) is underdeveloped
- Such a system generates dependence on traditional programmes at educational institutions rather than self-responsibility for learning and the creation of innovative approaches to education for practising practitioners
- May reduce the availability of practitioners because they may spend more time at educational activities
- In the United States, maintenance of clinical standards is not necessary to comply with existing mandatory requirements. In some states, only a small percentages of practitioners actually have needed to increase their participation in continuing education
- As it is not possible to equate attendance at educational programmes with clinical competence, mandatory continuing education will not improve the performance of incompetent practitioners
- The cataloguing of hours has led to unprofessional behaviour as some practitioners may register for a programme and fail to attend
- May lead to the proliferation of programmes that may be of questionable quality. The profit motive may underlie some arguments for mandatory continuing education
- Mandatory continuing education is needed only for a few uncommitted practitioners - most practitioners continue their own self-education
- All practitioners are treated in the same way .Thus a promotion of rigidity occurs that does not allow for individual differences in learning
- Much of continuing education remains essentially experimental and amateurish in both method and content
- To promote a positive public image of practitioners by publicising a system of mandatory continuing education is to indulge in the rhetoric and window-dressing that is to be more expected of politicians and advertising agencies than an ethical profession

***** Taken from Ward(66) (adapted from Chouinard)

CONCLUSION

The issues surrounding continuing education, in particular compulsory continuing education, are complex. The expectations of society are altering, and the professional requirements of health-care practitioners of all disciplines is constantly in a state of flux. Superimposed upon this are the individual needs of practitioners and their patients which also vary. Hence ongoing learning and development of skills that will improve the health of the community are necessary, although not always easily identifiable. Assessing the competency of practitioners and ensuring that they meet designated requirements will partly fulfil this need. However, further research into determining what constitutes successful outcomes with regard to chiropractic and osteopathic treatment will enable constructive continuing education programmes.

Underpinning this needs to be an attitudinal shift of practitioners from early in the undergraduate years which instils a strong desire to continue to learn, and a moral and ethical basis to undertake self-driven continuing education. Research directed at finding out how to develop this trait is needed.

There is at this time inadequate scientific evidence to support mandatory continuing education. However, there is enough evidence to support continuing education in general terms. If the registration boards decides to make continuing education a condition of re-registration then it should be accompanied by a co-operative effort with the professions and a concerted research effort to study outcomes.

REFERENCES

1. Davis D, Thomson M et al. Evidence for the Effectiveness of CME. A Review of 50 Randomized Controlled Trials. *JAMA* 1992; 268; 1111-1117.
2. Feller-Dansokho E, Ki-Zerbo G, Badiane S. Diagnostic and therapeutic management of uncomplicated malaria attacks in the Dakar region, Senegal. *Ann Soc Belg Med Trop (BELGIUM)* 1994; 74 (4): 291-300.
3. Conn RB. Continuing clinical chemistry education in the United States. *Clin Chim Acta* 1994; 232: 47-51.
4. Masseyeff RF, Dreux C, Goussault Y. The impact of clinical biochemistry on university education in France. *Clin Chim Acta* 1994; 232: 143-52.
5. Sanders GT, Brombacher PJ. Clinical biochemistry training in the Netherlands. *Clin Chim Acta* 1994; 232: 133-41.
6. Garrahy R, Thibodaux L, Hickman C, Caldwell D. Continuing education requirements to maintain occupational therapy licensure. *Am J Occup Ther* 1992; 10: 939-42.
7. Young RC Jr, Rachal RE, Morgan AL. Maximizing communication skills in graduate and postgraduate health-care education through medical writing. *J Natl Med Assoc* 1991; 83(8): 691-6.
8. Cowling C. Mandatory refreshment for nurses: an incentive to return? *J Adv Nurs* 1990: 15(7): 855-8.
9. Behroozi KR, Tolle-Watts SL, Shuman D. Attitudes of dental hygenists toward continuing education. *J Dent Hyg* 1989; 63(9): 424-31.
10. Anon.ymous. Mandatory AIDS training: is it necessary? *MNA Accent* 1990; 62(3): 4.
11. Stokamer CL. Breastfeeding promotion efforts: why some do not work. *Int J Gynaecol Obstet* 1990; 31 (suppl 1) 61-5.
12. Klaas M. Mandatory AIDS education [letter]. *Oncol Nurs Forum* 1989; 16(2): 156.
13. McCormick RH. Regards compulsory continuing education as a sham [letter]. *J Am Vet Med Assoc* 1988; 192(9): 1165-6.
14. Campione WA. Predicting participation in retirement preparation programs. *J Gerontol* 1988: 43(3): 91-5.
15. Finley C. Mandatory continuing education - a survey of current activity. A special communication. *Phys Ther* 1988; 68(3): 347-7.
16. Northup G. The importance of conventions. *J Am Osteopath Assoc* 1978; 78(3): 175.
17. Ward W. Leadership opinions: The future of osteopathic postdocral training. *J Osteopath Assoc* 1987: 87(11): 735-44.
18. Willard R, Ward W. Assessment of the postdoctral training needs of the osteopathic medical profession. *J Am Osteopath Assoc* 1987; 87(11): 727-34.
19. Myer C. The century club: A model for staff-supported medical education. *J Am Osteopath Assoc* 1990; 90(5): 439-45.
20. Reuther G. Continuing osteopathic medical education. *J Am Osteopath Assoc* 1988; 88(11): 1399-1402.
21. Northup G. Expanding role of CME. *J Am Osteopath Assoc* 1986; 86(1): 18.
22. Coyle B. Administration in chiropractic education. *J Manip Physiol Ther* 1993; 16(4): 266-73.
23. De Coster L Ebrall P. A description of WorkCare claims where chiropractors wrote the initiating certificate: Victoria 1990/91. *Chiropractic Journal of Australia* 1993; 23(1): 33-7.
24. Hayes R, Davis D, McKinnon A, Tugwell P. A critical appraisal of the efficacy of continuing medical education. *J Am Med Assoc* 1984; 251: 61-4.
25. Ell S. Five hundred years of specialty certification and compulsory continuing medical education: Venice 1300-1801. *J Am Med Assoc* 1984; 251: 752-3.
26. Kleynhans A. Implications of distance education for chiropractic. *J Chiro Ed* 1992; 6(2): 55-66.
27. Gromala T. Problem solving methodology in the chiropractic occupational health diplomate postdoctral curriculum. *Proceedings of the Int'l Conference on Spinal Manipulation.* 1992; 33.
28. Phillips C, Boyd B, Mathews S, Perron M, Wagenius C. Advanced chiropractic training in care and management of the pediatric patient. *J Chiro Ed* 1992; 6(1): 19-22.
29. Paton A. Coping with the journal "mountain". *Postgrad Med J* 1985; 61: 935-8.

30. Hoagland R. Another new technique. *J Chiro* 1991; 28(10): 75-6
31. Cherkin D, Deyo R, Berg A. Evaluation of physician education intervention to improve primary care for low back pain II. *Spine* 1991; 16(10): 1173-8.
32. Anonymous. So many seminars... So little time. *Am Chiro* 1991; 13(10): 39-40.
33. Southerland R. Training nutrition oriented chiropractors. *Todays Chiro* 1990; 19(5): 88-91.
34. Cyriax J. Refresher courses for general practitioners: the treatment of mubar disk lesions. *J Orthop Sports Phys Ther* 1990; 12(4): 163-68.
35. Halderman S. The limitations of single journal reading [editorial]. *J manip Physiol Ther* 1991; 14(2): 93-94.
35. Dally D. The New Zealand association of musculo-skeletal medicine. Postgraduate courses for doctors. *Manual Medicine* 1989; 4(3): 94.
36. Giles L. Chiropractic continuing education: a critical review [letter]. *Am J Chiro Med* 1990; 3(1): 42.
37. Beck A. Sprieser P. The need for improvement of continuing professional education in chiropractic. *Dig Chiro Econ* 1987; 30(1): 55-6.
38. Charlton K. Sheehan M. Proposed masters degree in chiropractic science: an interest survey. *J Aust Chiro Assoc.* 1989; 19(3); 97-100.
39. Hilderbrandt R. Chiropractic continuing education: a critical review. *Am J Chiro Med* 1989; 2(3): 89-92.
40. Northup G. Continuing medical education: A sharpening focus. *J Am Osteopath Assoc*. 1984; 84(2): 174.
41. Hill T. The importance of postgraduate education [guest editorial]. *JCCA* 1985; 29(1): 9.
42. Bare J., Barbuto L. Report on the Joint NAAMM-USC seminar on manipulative medicine. *JCCA* 1979; 23(1): 23-4.
43. Nelson W. AJCM journal clubs [letter]. *Am J Chiro Med* 1989; 2(4): 180.
44. Chance M., Peters R. Competence, consensus and chiropractic. *Chiropractic Journal of Australia* 1992; 22(3): 81.
45. Kogon P. Canadian fellowship membership requirements [letter]. *JCCA* 1981; 25(2): 44-5.
46. Reuther G., Rodgers D. Continuing medical education. *J Am Osteopath Assoc* 1994; 94(11): 961-70.
47. Stiles E. Postdoctral education in the osteopathic hospital. *Osteopath Ann* 1977; 5(6): 47-50.
48. Northup G. They're playing our song. *J Am Osteopath Assoc* 1979; 78(10): 44-5.
49. Anonymous. ACA's "Three dimension" education program is an overwhelming success: Attendees applaud ACA's free workshops as an outstanding member benefit. *J Chiro* 1992; 29(2): 40-1.
50. Anonymous. Professional development. *Proceedings of the Mercy Centre consensus conference.* 1992; 185-91.
51. Jamison J. Motivational factors in continuing self-education. *Eur J Chiro* 1991; 39(1): 27-32.
52. Pallister S. Continuing education for chiropractors in Canada. *JCCA* 1989; 33(3): 121-2.
53. Anonymous. ACA chiropractic hospital privileges seminar in Houston opens new frontier. *J Chiro* 1991; 28(12): 57-61.
54. Henderson D. Kogon P. Postgraduate courses leading to advanced training and certification in chiropractic. *JCCA* 1981; 25(1): 21-2.
55. Coulter I. The role of the entrepreneur in postgraduate education. *JCCA* 1985; 29(3): 121-3.
56. Cherkin D. Deyo R. Berg A. Bergman J. Lishner D. Evaluation of physician education intervention to improve primary care for low back pain I. *Spine* 1991; 16(10): 1168-72.
57. Golding R. Some aspects of recent developments in chiropractic education within Australia. *J Aust Chiro Assoc* 1987; 17(4): 122.
58. Dalley D. The New Zealand association of musculo-skeletal medicine-postgraduate education programme. *Manual Medicine* 1990; 5(1): 6-8.
59. Tait B. A new postgraduate diploma in musculoskeletal medicine for New Zealand doctors. *Manual Medicine* 1989; 4(3): 94.
60. Kleynhans A. Postgraduate and speciality education for chiropractors. *J Aust Chiro Assoc* 1987; 17(3): 94-8.
61. Baffi C. Redican K. Morris L. Schroeder K. Olsen L. Demographic and practice characteristics of chiropractors. *J Manip Physiol Ther* 1988; 11: 85-8.
62. Grieve G. The post-graduate teaching of manipulation. *Physiotherapy* 1970; 56: 21-8.
63. Cyriax J. Refresher course for general practitioners: the treatment of lumbar disk lesions. *Br Med J* 1950; 2: 1434-8.
64. Ward J. Continuing medical education. Part1. Introduction to the series. *Med J Aust* 1988; 148: 20-22.
65. Ward J. Continuing medical education. Part 2. Needs assessment in continuing medical education. *Med J Aust.* 1988; 148: 77- 80.
66. Ward J. Continuing medical education. Part 5. Mandatory continuing education. *Med J Aust.* 1988; 148: 237-239.
67. Hayes TM. Continuing medical education: a personal view. *BMJ* 1995; 310: 994-96.